

NAVAL HEALTH RESEARCH CENTER

1

AD-A280 845



HAZARDOUS MATERIAL LIFE-CYCLE COST MODEL

SYSTEM USER'S GUIDE

VERSION 1.2

DTIC
ELECTE
S F D
JUN 29 1994

B. J. LaFleur
J. A. Jaeger
L. A. Hermansen

DTIC QUALITY INSPECTED 2

94-19652

Technical Document 93-5E

94 6 28 005

Approved for public release; distribution unlimited.



NAVAL HEALTH RESEARCH CENTER
P. O. BOX 85122
SAN DIEGO, CALIFORNIA 92186 - 5122

NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND
BETHESDA, MARYLAND



Hazardous Material Life-Cycle Cost Model

System User's Guide

Version 1.2

Bonnie J. LaFleur
Jennifer A. Jaeger
Lawrence A. Hermansen

Naval Health Research Center
Medical Information Systems and
Operations Research Department
P.O. Box 85122
San Diego, CA 92186-5122

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

- Document No. 93-5E was supported by the Naval Medical Research and Development Command, Bethesda, MD, Department of the Navy, under a NAVFAC Reimbursable Work Unit. The views expressed in this article are those of the authors and do not reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.
-

Summary

The Hazardous Material Life-Cycle Cost Model(HMLCCM) was developed to estimate the total life-cycle costs of using various hazardous materials in the construction, maintenance, and repair of U.S. naval systems and facilities. The model estimates those costs derived from the need to protect the health and safety of workplace personnel and the need to protect the environment. The purpose of this guide is to provide users with a detailed description of the system as well as the basic structure and features of the HMLCCM and instructions on how to use the system. This report is an updated version of the original user's guide. Changes include added functionality by including permissible exposure levels (portion of OSHA Z-Table) and on-line access to Material Safety Data Sheets (MSDS) based on the current Hazardous Information System (HMIS).

Table of Contents

	Page
Preface	i
Summary	ii
Table of Contents	
 Section 1	
Introduction	
1.1 Purpose of the Model	1
1.2 Cost Factors	1
1.3 Cost Elements	3
1.4 Cost Items	3
 [B[A Section 2	
HMLCCM Software Summary	
2.1 Programming Language	4
2.2 Security/Privacy	4
2.3 Maintenance	4
2.4 System Organization	4
 Section 3	
Accessing the System	
3.1 Logon to HMLCCM	5
3.2 Choosing Menu Options With the Keyboard	6
3.2.1 Selecting Menu Pads	6
3.2.2 Selecting Menu Options	6
3.3 Choosing Menu Options With the Mouse	6
3.4 Logout of HMLCCM	7
 Section 4	
Systems Operation	
4.1 Cost Analysis	8
4.1.1 Define a New Scenario	9
4.1.2 Defining a Scenario With Multiple Steps	10
4.1.3 Retrieving a Scenario	11
4.1.4 Selecting Computation Options	13
4.1.4.1 Cost Estimate	13
4.1.4.2 Selecting Variance Options	14
4.2 On-line OSHA Z-Table Reference	16
4.3 On-line Hazardous Materials Reference	16

Table of Contents

	Page
4.3.1 Print On-line Reference Information	17
4.3.2 Select Another Material	18
4.3.3 Exit On-Line Reference	18
4.4 Maintenance	18
4.4.1 Backing-up Files	18
4.4.2 Up-Loading Data	19
4.5 Set Parameters	19
Section 5	
Menus	
5.1 System Menu	20
5.1.1 Help	20
5.1.2 Calculator	20
5.1.3 HMLCCM	21
5.2 File Menu	22
5.2.1 Printer Setup	22
5.2.2 Print	23
5.2.3 Quit	23
Appendix	
Terms and Abbreviations	24

Section 1 Introduction

1.1 Purpose of the Hazardous Material Life-Cycle Cost Model

In 1987, the Chief of Naval Operations (CNO) instructed all Navy commands to reduce the amount of hazardous waste by 50 percent by December 1992, using 1987 levels as their baseline. To accomplish these goals Navy personnel are implementing management control practices and up-to-date technology. The Hazardous Material Life-Cycle Cost Model (HMLCCM) was developed to assist Navy personnel in conducting cost analyses when making decisions about the procurement of various hazardous materials. The HMLCCM aggregates the costs derived from actions taken to protect the health of the worker or to preserve the environment when a particular hazardous material is used.

1.2 Cost Factors

The primary cost of using nonhazardous materials is procurement cost; however, when using hazardous materials (HM) added expenses are incurred because of the need to protect the individual's health and the environment. The added expenses that elevate the basic procurement cost of a material can be grouped into a set of cost factors. Cost factors identified by interviews with experts in the field (see The System Manager's Guide) were included in the initial HMLCCM. These are as follows:

Claims and Compensation	Processing claims, monitoring cases, conducting interventions to resolve problems, assessment of liability, and providing appropriate payment.
Disposal	Discard, permanent containment, or treatment to eliminate the toxic potential of a hazardous substance, product, or waste.
Engineering Controls	Construction, maintenance, and repair of structural equipment used to prevent personal and environmental exposures to hazardous materials.
Fines and Penalties	Costs incurred because of federal, state, or local safety and environmental regulatory violations, including improper or incomplete recordkeeping.

	unsafe working conditions, and environmental pollution.
Medical Surveillance	Medical consultations, examinations, tests, and procedures, including baseline and periodic, as well as event-driven medical encounters.
Medical Treatment	Medical care for occupational injuries or illnesses due to exposure to a hazardous substance, product, or waste.
Permits and Certification	Local, state, and federal permits required for transportation, storage, and use of certain hazardous materials at a facility.
Personal Protective Equipment (PPE)	Gear that is issued to individual workers to prevent exposure to hazardous materials, including maintenance, inspection, distribution, replacement, and inventory.
Procurement	The initial cost of the material.
Spill Containment and Cleanup	Responses to spills of hazardous materials, including costs of equipment and personnel.
Storage	Storage of the hazardous material before use, and storage of any resulting hazardous waste before disposal.
Training	Instructions regarding the legal requirements pertaining to hazardous materials, and information regarding methods and procedures for minimizing the risk of exposure to a hazardous material.
Workplace Monitoring	Surveys, inspections, and monitoring of the workplace, processes, materials, and personnel for the purpose of maintaining the health and safety of workers, and to protect the environment.

1.3 Cost Elements

Cost factors are broad categories of individual cost components that when combined make up the total HM use cost. Cost elements are subcategories of cost factors. Cost elements make up the cost factors, similar to the way cost factors make up the total HM use cost. For example, personal protective equipment (PPE) is a cost factor, however, there are many different kinds of personal protective equipment such as gloves, respirators, and boots. These are the cost elements for the cost factor PPE. Thus, the cost of a factor is computed as the summation of the cost elements associated with the factor.

1.4 Cost Items

The expenditure for a cost element depends on the specific item acquired. For example, gloves may cost between \$1.00 and \$25.00 per pair, depending on the type of glove purchased. The various products used to meet the requirement of a cost element are called cost items. Each cost item has a unique price.

Section 2 HMLCCM Software Summary

2.1 Programming Language

The HMLCCM software was developed using Microsoft's FoxPro. FoxPro is a database management system created for the personal computer.

2.2 Security/Privacy

The security module will maintain user passwords, which allow logon access to the HMLCCM program and database files. Menu options are assigned to the user through a security key system in FoxPro. HMLCCM does not collect or store Privacy Act data.

2.3 Maintenance

The primary maintenance functions consist of security, file and format definition, user file updates, and data initialization.

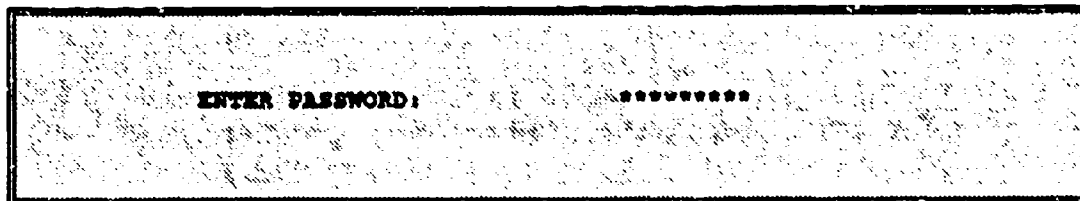
2.4 System Organization

The HMLCCM has four modules or user options (described in Section 4), which include Cost Analysis, Reference, Set Parameters, and System Maintenance. To access the Set Parameter option a password is required.

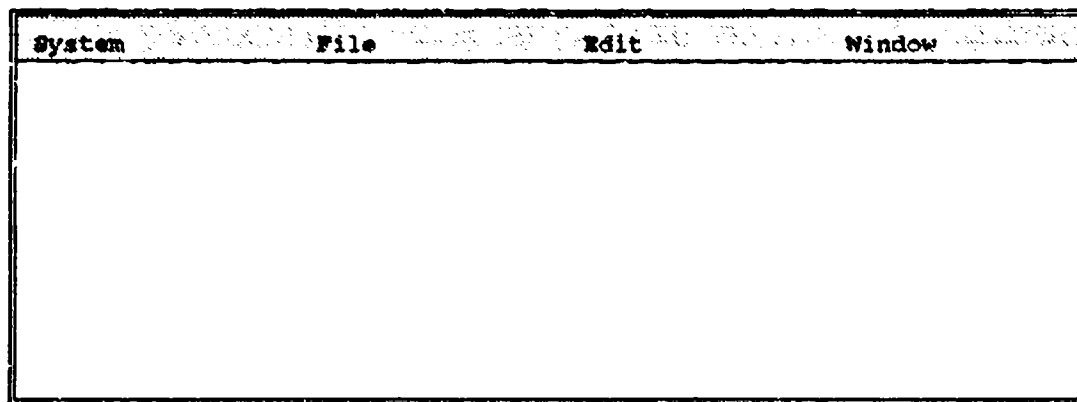
Section 3 Accessing the System

3.1 Logon to HMLCCM

At the MS-DOS prompt, (C:\HMLCCM) type HMLCCM and the security prompt will display:



Type in the password and press Enter or "Carriage Return" <CR> . If the password is unknown press <CR>. The password allows the user to access the set parameters option. If the user is unable to provide the appropriate password, reference, maintenance, and cost analysis will be the only options accessed. A brief greeting will be displayed before the following desktop appears:



The parts of the menu system are shown on page 6, along with steps for choosing menu options with the keyboard and mouse. If your system does not have a mouse you will need to use the keyboard.

3.2 Choosing Menu Options With the Keyboard

Selecting Menu Pads and Menu Options are executed differently when using the keyboard. The following are instructions on how to select Menu Pads and Menu Options with the keyboard.

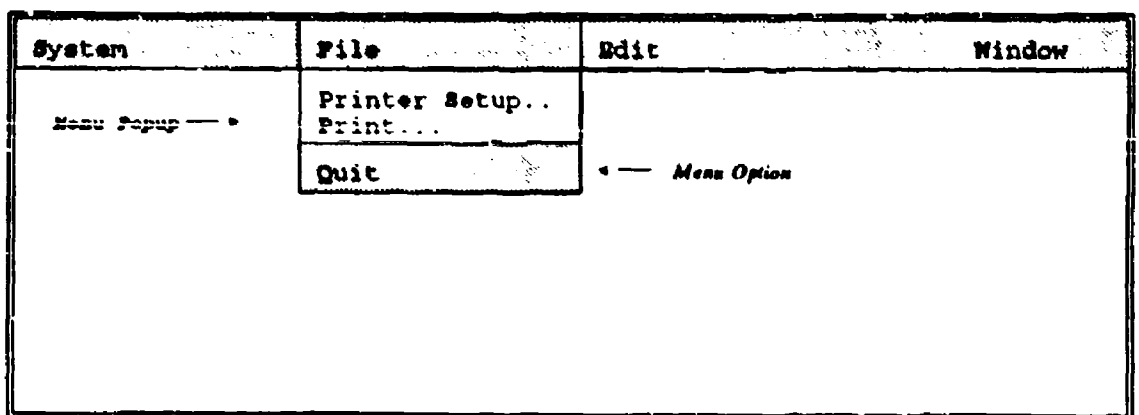
3.2.1 Selecting Menu Pads

Four Menu Pads are available to the user: System, File, Edit, and Window. Press the Alt key in conjunction with the first letter of the Menu Pad you want to select. For example, if you want to access the File Menu Pad press Alt F.

3.2.2 Selecting Menu Options

A Menu Popup appears, containing a list of Menu Options, when a particular Menu Pad is selected. There are two ways to select a Menu Option using the keyboard:

1. Press the ↑ or ↓ keys to highlight the desired Menu Option and press <CR>.
2. Type the bold letter of the Menu Option you want and press <CR>.



3.3 Choosing Menu Options With the Mouse

1. Point to the Menu Pad and press the Left mouse button to display the menu popup
2. Point to the desired option and press the Left mouse button.

3.4 Logout of HMLCCM

To return to the MS-DOS prompt, Choose Quit from the File Menu Pad.

System	File	Edit	Window
	Printer Setup.. Print...		
	Quit		

Section 4 Systems Operation

4.1 Cost Analysis

To calculate how much it will cost to use a particular hazardous material you will first need to define the circumstances in which the substance will be used. For example, you may use 5 gallons of lead-based paint or 4 gallons of PD-680. Specification of the circumstances for using a hazardous material is called the hazardous material scenario. Each scenario consists of one or more steps. For each step of a scenario, a material, phase, process, number of people, number of days, and quantity of material must be defined. To create a scenario follow the instructions outlined below.

1. Choose HMLCCM from the System Menu Pad.

An option menu will appear on the screen.

2. Choose Cost Analysis from the option menu.

This will direct you to the Build Hazmat Scenario prompt as shown below:

System	File	Edit	Window
Help... F1			
Calculator			
HMLCCM ▶	Cost Analysis ▶	Build HAZMAT Scenario	
	OSHA 2-Table		
	Reference Material		
	System Maintenance		
	Set Parameters		

3. Press <CR>.

The following box will appear:

Cost Analysis				
Scenario:	<input type="text"/>			
<New>	<Retrieve>	<Delete>	<Browse>	<Cancel>

You are now in the Cost Analysis option. You can do two things: (1) you can define a new scenario, or (2) you can retrieve an already existing scenario.

4.1.1 Defining a New Scenario

1. Type in a file name and press <CR>.

The cursor should default to the submenu below and highlight New.

2. Select New from the submenu below and press <CR>.

The following screen will display:

HAZARDOUS MATERIAL SCENARIO			
Step # 1	Scenario: 1 Example		
Material:	<input type="text"/>	< Add >	
Phase:		< Edit >	
Process:		< Next >	
		<Previous>	
		< Exit >	
Number of Employees:	<input type="text"/>	Number of days:	<input type="text"/>
Quantity of material:	<input type="text"/>	Unit:	<input type="text"/>
< Save > <Cancel>			

Note: The users can only input materials, phases, and processes that have previously been defined. To ensure that you are using an item that has previously been defined type ? <CR> to access the list of choices.

3. Type in the name of the hazardous material used and press <CR>.
4. Type in the phase and press <CR>.
5. Type in the process and press <CR>.
6. Type in the number of employees who performed the process and press <CR>.
7. Type in the number of days that the process took to complete and press <CR>.
8. Type in the quantity of material used in the process and press <CR>.

Note: The unit of material is defined when the material is defined; therefore, the unit will never need to be input at the hazardous material scenario screen.

9. Select Save on the submenu below and press <CR>.
10. Select Exit on the side menu and press <CR> (Skip to Section 4.1.3 Step 5).

4.1.2 Defining a Scenario With Multiple Steps

A scenario consists of one or more steps, in which each step specifies a material, phase, process, number of people involved, the duration of the task, and quantity of material. Steps enable the user to calculate costs for the separate components of a complex process. For example, one may want to determine the cost of painting an airplane where both the construction cost and maintenance cost are of interest. The components or steps of this process might include applying the paint during construction, and then stripping and repainting during the maintenance phase. Therefore, the hazardous material scenario would consist of the steps found below:

Step 1:

Material: *Lead paint*
Phase: *Construction*
Process: *Spray painting*

Step 2:

Material: *Methylene chloride*
Phase: *Maintenance/Repair*
Process: *Faint stripping*

Step 3:

Material: *Lead paint*

Phase: *Maintenance/Repair*

Process: *Spray painting*

Once you have identified the steps you will need to enter them into the HMLCCM.

First follow the instructions in 4.1.1 (Defining a New Scenario) for entering in Step 1. After you have defined a scenario you will notice that at the top left corner will be Step 1 and the top right corner will be the scenario name. To create another step follow the instructions below:

1. At the scenario dialog box, select the scenario you just created by typing in the name.

The hazardous material scenario material dialog box will appear on the screen.

2. Select Add on the side menu.
3. Input the material, phase, process, quantity of material, number of employees and days.

After you have done this you will notice that it is now Step 2.

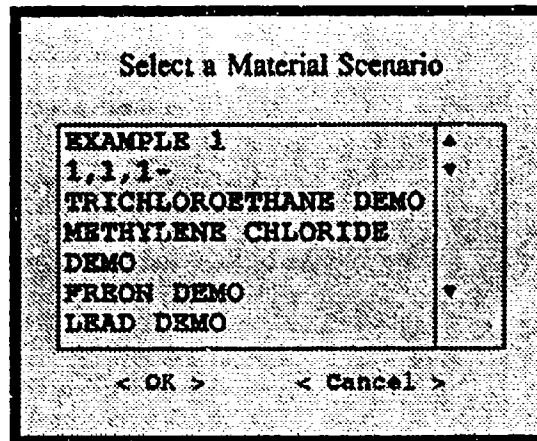
4. Select Save on the submenu below and press <CR>.
5. Select Exit on the side menu and press <CR> (Skip to Section 4.1.3 Step 5).

4.1.3 Retrieving a Scenario

If you do not want to define a new scenario, you have the option of accessing a scenario in the database that has been previously defined. To retrieve a scenario that already exists follow the instructions on the next page.

1. Type ? <CR>

A list of all the scenarios in the database will appear on the screen (shown below):



2. Select by using the ↑ or ↓ keys until the scenario you want to retrieve is highlighted.

3. Press <CR>.

The cursor will default to the submenu below and highlight retrieve.

4. Select Retrieve and press <CR>.

5. The scenario you have selected will appear.

6. You may move the cursor to the Side Bar option you wish to select. If you want to compute the cost, move the cursor to <<Exit>> and press <CR>.

A dialog box will appear asking you if you want to do computations now.

7. Press Yes and <CR>.

The following box will display:

COMPUTE COST VALUE			
Estimated Cost	Scenario:	1 Example	Estimated Variance
[]	for Product:	<input type="text"/>	[]
[]	for Step:	<input type="text"/>	[]
[]	for Factor:	<input type="text"/>	[]
[]	for Factor:	<input type="text"/>	at step: <input type="text"/>
[]	for Phase:	<input type="text" value="MAINTENANCE/REPAIR"/>	
# of iterations	Total of Scenario Cost:		() Yes () No
200	< OK > <Browse> <Cancel>		

Note: For a review of the terms used in this menu see Appendix A.

4.1.4 Selecting Computation Options

This option allows the user to calculate the estimated cost of a scenario or a portion of a scenario. In addition, the user can derive variance for the cost estimate using a bootstrap analysis.

4.1.4.1 Cost Estimate

The cursor will appear in the first Cost Box. If you are using a keyboard use the ← and → keys to move to the next option.

The following list describes the functions of each of the cost boxes:

Cost Box 1: Computes the estimated cost for all materials or a specific product.

Cost Box 2: Computes the estimated cost for all steps in the scenario or only one step.

Cost Box 3: Computes the estimated cost for factors across all steps.

Cost Box 4: Computes the estimated cost for a particular factor at a particular step.

Cost Box 5: Computes the estimated cost for a particular phase.

If you are interested in the total scenario cost, for example, the total cost to paint an airplane, select the "Total of Scenario Cost" radio button at the bottom of the screen.

For selecting the cost computation option follow the instructions below:

1. Select the cost box on the left side of the screen by positioning the cursor on the box and pressing <CR>.
2. Move the cursor to the option box parallel to the compute box and press <CR>.

A dialog box will appear displaying your options.

3. Highlight the option you want and press <CR>.

Note: If your scenario includes more than one step and you have defined these steps you will have the option to compute cost for all the steps or for only one of the steps. If you have not defined more than one step you will only be able to compute for that particular step.

4.1.4.2 Selecting Variance Options

The Variance Box allows the user to conduct a bootstrap analysis to determine the variance of a cost estimate. The results are presented as the mean and standard deviation of a set of samples. The user determines the number of samples by specifying the number of iterations.

Note: The System will only allow you to estimate the variance of one cost factor at a time.

For selecting a variance option follow the instructions below:

1. Move the cursor to the Variance Box and press <CR>.

Finish selecting any cost options before you continue.

2. Select the number of iterations by entering the number in the box to the left and press <CR>.

Note: The default value for iterations is 200. Using this value will require several minutes of computer time. The user may select a

smaller value if desired, however, larger values will yield more accurate estimates.

3. Select <OK> on the submenu below and press <CR>.

A dialog box will appear with several variance options.

4. Select by highlighting the option and press <CR>.

A message window will appear with "Calculating" in the box until the estimated cost and variance results appear.

4.2 On-Line OSHA Z-Table

The user may need to reference the personal exposure limits for a particular chemical substance. This option displays an online reference table, named TLV, which is a subset of the OSHA Z-Table set forth by the Occupational Safety and Health Administration United States Department of Labor. Information given in the table includes Chemical Abstract Number (CAS Number), Time Weighted Average (TWA), and Short Term Exposure Limit (STEL). To view this table follow the steps below:

1. Choose **HMLCCM** from the **System** menu.
An option menu will appear on the screen.
2. Choose **OSHA Z-Table** from the option menu.
3. To view full screen press **Ctrl-F10**.
4. Return to desktop by pressing **Esc**.

4.3 On-Line Hazardous Materials Reference

An on-line reference option is available, which allows the user to retrieve the Material Safety Data Sheet (MSDS) which includes information, such as: Synonyms/Trade names, Common uses, Descriptions, Chemical/Physical Properties, Occupational Exposures, Exposure limits, Health Hazards, Medical Surveillance, Special Tests, Personal Protective Equipment, and Treatments. To access this information follow the steps below:

1. Choose **HMLCCM** from the **System** menu.
An option menu will appear on the screen.
2. Choose **Reference** from the option menu.

System	File	Edit	Window
Help... F1			
Calculator			
HMLCCM ▸	Cost Analysis ▸		
	OSHA Z-Table		
	Reference Material		
	System Maintenance		
	Set Parameters		

The following box will appear:

MATERIAL:
(Enter NIIN, Brand Name or '?' for Help)
< OK > < Cancel >

3. Type ? and press <CR>.

A list of all the materials in the database will appear on the screen (shown below).

Select a Material

1,1,1-TRICHLOROETHANE	▲
2-ETHOXYETHANOL	▼
CHROMIUM COMPOUNDS	
FREON 113	
HI SOLV	
LEAD (INORGANIC)	▼
METHYLENE CHLORIDE	

< OK > < Cancel >

4. Select by using the ↑ or ↓ keys until the material you want is highlighted.
5. Press <CR>.

The cursor will default to the submenu below and highlight OK.

6. Select OK and press <CR>.

The screen will display the hazardous material you selected and the information found on the MSDS as previously mentioned. To scroll down the screen use the ↑ and ↓ keys.

4.3.1 Print On-Line Reference Information

Occasionally you will want to print the reference information that appears on the screen to do this follow the instructions below:

At the on-line reference screen:

-
1. Press **Shift** and **Tab** at the same time to move the cursor to the submenu below.
 2. Select **Print** and press **<CR>**.

4.3.2 Select Another Material

If you would like to display a new hazardous material without returning to the Menu Pads you may follow the directions below.

At the on-line reference screen;

1. Press **Shift** and **Tab** at the same time to move the cursor to the submenu below.
2. Select **Another** and press **<CR>**.

4.3.3 Exit On-line Reference

1. Press **Shift** and **Tab** at the same time to move the cursor to the submenu below.
2. Select **Exit** and press **<CR>**.

4.4 Maintenance

Occasionally you will want to back-up your files onto floppy disks or to upload data that was done on another computer. To perform these functions follow the instructions listed below:

4.4.1 Backing-up files

1. Choose **HMLCCM** from the **System** menu.

An option menu will appear on the screen.

2. Choose **System Maintenance** from the option menu.

Another option menu will appear on the screen.

3. Choose **Back-Up (floppy)** from the option menu (shown below).

The computer will prompt you to insert your diskette. Put your diskette in drive A and follow the computer's directions.

System		File	Edit	Window
Help...	F1			
Calculator				
MMLCM		Cost Analysis		
		Reference		
		System Maintenance	Back-up (floppy)	
		Set Parameters	Upload Data	

4.4.2 Uploading data

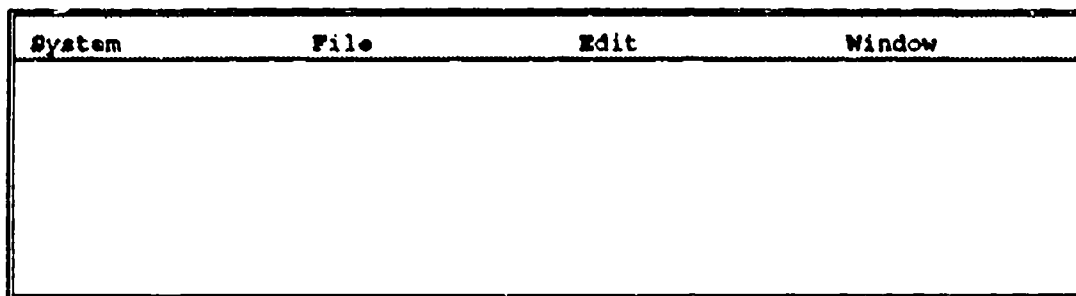
Put a diskette in drive A. Follow the computer's directions.

4.5 Set Parameters

To access the Set Parameters option the user has to provide a password when logging onto the System. For instructions on setting parameters see The System Manager's Guide.

Section 5 Menus

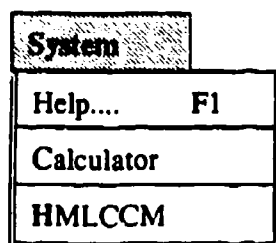
The HMLCCM commands appear in two menus: **System** and **File**. The **Edit** and **Window** menus contain commands that the user will not need to access.



A command is an instruction to your computer to carry out an action, such as printing a document. When you pull down a menu, you will notice that some commands appear in dark text while others are dimmed. You can use the commands in dark text immediately, but you cannot choose a dimmed command until it becomes dark.

5.1 The System Menu

The **System** menu contains the commands for logging on the HMLCCM system and desk accessories, such as the Calculator and Help.



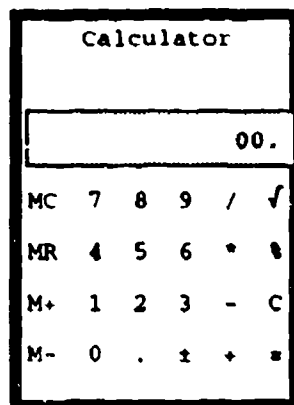
5.1.1 Help

The HMLCCM system offers on-line help. The Help contains instructions describing all the HMLCCM functions. Select **Help** from the **System** menu or press F1. A Help window will display with general topics, commands, and functions. The Help window can be scrolled by using the arrow keys on the keypad. To find the topic you want, you can scroll through the list or, while you are in the Help window, type a letter or series of letters to select the first list item beginning with the specified letter(s).

5.1.2 Calculator

The system has a four-function pocket calculator that will appear on the screen when you select Calculator from the System menu. The Calculator is used like a standard pocket calculator.

Calculations can be performed using the keyboard or the mouse.



With the keyboard, you can type the equation as it would be written. Most Calculator keys have the same keyboard equivalents, with the following exceptions:

Keystroke	Equivalent
Q	$\sqrt{\quad}$
R	MR
N	\pm
A	M+
Z	MC
S	M-

To calculate $8 \times 16 + 23$ and take the square root of the result using the keyboard: Type $8*16+23=Q$. The result is 12.28.

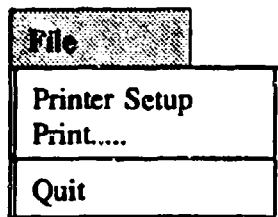
To perform the same calculation with the mouse, simply click on the appropriate numbers and symbols on the Calculator.

5.1.3 HMLCCM

This option allows the users to access the system. The system contains four options: Cost Analysis, Reference Materials, System Maintenance, and Set Parameters.

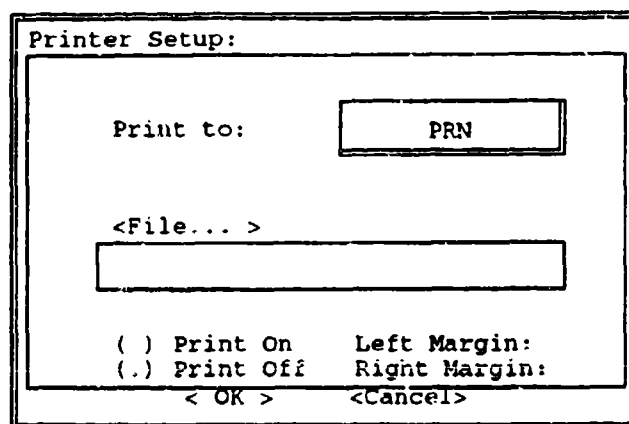
5.2 The File Menu

The **File** menu contains the commands for printing documents, and ending a work session.



5.2.1 Printer Setup

Printer Setup displays the Printer Setup dialog.



In this dialog, you can choose a print device from the **Print to** popup. If you choose **File** from the popup, you could specify a file to which output will be sent. To do this, type a file name in the text box.

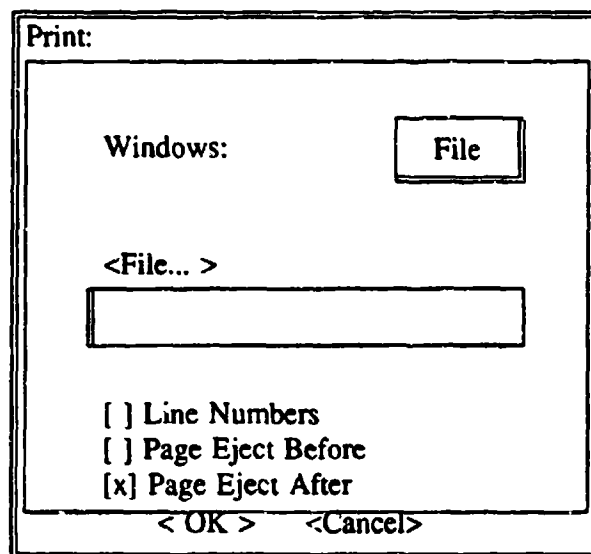
Adjust the settings for left margin and right margin, if necessary.

Choose the **Print On** and **Print Off** radio button to enable or disable output to the printer.

When your settings are correct, choose **OK** to activate them or choose **Cancel** to exit the dialog without changing the current print settings.

5.2.2 Print.

When you select **Print** from the **File** menu, the Print dialog displays the following menu:



Choose the source from the **Windows** popup. To print the contents of a file that is not currently open, choose the **File** option from the **Windows** popup. Then, in the text box, type the name of the file you want to print.

When the **Line Numbers** check box is checked, HMLCCM automatically adds line numbers to the output.

When the **Page Eject Before** check box is checked, HMLCCM sends form feed to the printer before printing. When the **Page Eject After** check box is checked, HMLCCM sends a form feed to the printer after printing.

Once the settings in the **Print** dialog are correct, choose **OK** to confirm your choices or **Cancel** to exit the dialog without taking action.

5.2.3 Quit

Quit ends your HMLCCM session and returns you to the system prompt.

Appendix Terms and Abbreviations

Browse	To display data in a Browse window.
Bootstrap	A method for estimating the variance of a variable from a set of observed values.
Carriage Return <CR>	A command that is usually accessed by the Return key or the Enter key.
Check box	A pair of square brackets followed by text. Settings can be turned on and off by choosing the check box. If a check box has an X in it the setting is on.
Choose	To select a command or an option from a menu, or a control in a dialog.
Default	A preset response to a question or prompt. The default is automatically used by the computer if you don't supply a different response. Default values prevent a program from stalling or crashing if no value is supplied by the user.
Desktop	The screen that underlies all system and user-defined windows is called the desktop.
File	Any name that identifies a file.
Highlight	To make something visually distinct. For example, when you select a block of text, the selected text is highlighted.
Highlighted	Text that is emphasized so that it stands out from the surroundings. Highlighting something typically indicates that it is selected or is about to be chosen. Highlighted text may appear differently, depending on the type of monitor and color settings that you use.
HMIS	Acronym for Hazardous Material Information System.
HMLCCM	Acronym for Hazardous Materials Life-Cycle Cost Model.
HM	Acronym for Hazardous Material.
HW	Acronym for Hazardous Waste.
Menu	A list of choices presented by a program, from which you can select an option.
Menu Bar	A horizontal strip that appears at the top of the screen and contains Menu Pads.
Menu Options	Commands, found on the Menu Popups, that perform specific actions.

Menu Pads	A word, phrase, or icon on the Menu Bar that designates one menu. Positioning the cursor on a menu title highlights the title and display its options below it.
Menu Popup	List of related options. When you choose an option from a menu popup, you are telling the HMLCCM system what action to take.
Menu System	The combination of the Menu Bar, Menu Pads, Menu Popups and Menu Options.
MSDS	Acronym for Material Safety Data Sheet.
On-line help	A mini-reference guide, accessible while using the HMLCCM system, that provides additional information about HMLCCM commands and functions.
Options	A list of actions to choose from that are listed on a menu.
Phase	A level in the evolution of a system or product (e.g, construction, or maintenance/repair).
Prompt	A message on the screen that tells you of some need for response or action. A prompt usually takes the form of a symbol, a message, a dialog box or a menu of choices.
Process	The operation or treatment that utilizes the hazardous material described in the scenario.
Radio button	A set of parentheses followed by text. Radio buttons are grouped so that only one can be chosen at a time, like the buttons on a car radio. Choose a radio button to activate it. When a radio button is chosen, a bullet appears in the parentheses and any previously chosen radio button becomes deselected.
Scenario	The specific circumstances that define how a hazardous material is used.
Step	A component of a task that can be defined in terms of the material, process, and personnel that are required to accomplish the task.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Service, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE SEPT 94	3. REPORT TYPE AND DATE COVERED Final Oct 92-Sept 93
4. TITLE AND SUBTITLE Hazardous Material Life-Cycle Cost Model System Users/Operator's Guide		5. FUNDING NUMBERS Program Element: REIMB Work Unit Number: NAVFAC.WR.1026W	
6. AUTHOR(S) Bonnie J. LaFleur, Jennifer A. Jaeger, and Lawrence A. Hermansen		8. PERFORMING ORGANIZATION Document No. 93-5E	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Health Research Center P. O. Box 85122 San Diego, CA 92186-5122		10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Naval Medical Research and Development Command National Naval Medical Center Building 1, Tower 2 Bethesda, MD 20889-5044			
11. SUPPLEMENTARY NOTES			
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.		12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The Hazardous Material Life-Cycle Cost (HMLCC) Model was developed to estimate the total life-cycle costs of using various hazardous materials in the construction, maintenance, and repair of U.S. Naval Systems and facilities. The model estimates those costs derived from the need to protect the health and safety of workplace personnel and the need to protect the environment. This document is an updated version of the original User's Guide. Changes include permissible exposure levels and on-line access to Material Safety Data Sheets (MSDS) based on current Hazardous Information System.			
14. SUBJECT TERMS Life-cycle cost Model Cost-benefit Analysis		Hazardous waste Cost management Hazardous materials Cost-Analysis	15. NUMBER OF PAGES 29
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Unlimited

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102